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Methods of Combating Offenses in the Field of Ecology

Rostyslav SHCHOKIN

Private Joint-Stock Company Higher Educational Institution
Interregional Academy of Personnel Management, Ukraine

tod.boris45@gmail.com

Vasyl OLIINYK

Kyiv Court of Appeal, Ukraine

oliynikvi@ukr.net

Oleksandr AMELIN

Prosecutor General's Office, Ukraine

amelino@gmail.com

Yevhen BONDARENKO

Interregional Academy of Personnel Management

Educational and Scientific Institute of Law Prince Vladimir the Great, Ukraine

bondarenkolaw@gmail.com

Vitaliy MAZIYCHUK

Interregional Academy of Personnel Management

Educational and Scientific Institute of Law Prince Vladimir the Great, Ukraine

voitao55@ukr.net

Dmytro KYSLENKO

Interregional Academy of Personnel Management

Educational and Scientific Institute of Law Prince Vladimir the Great, Ukraine

kyslenko@gmail.com

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Abstract:

Environmental crime is dangerous in terms of the scale of the implications and the impact area. The resonance and specifics of environmental crimes require a special approach to the prevention and investigation of these crimes. The aim of the article was to systematize measures to prevent (counteract to) environmental crimes. The aim involved the following methods: statistical analysis, correlation analysis, generalization and analogy, hypothetico-deductive model and system-structural approach. Fundamental measures to prevent (counteract to) environmental crimes are defined. The countries with the largest and smallest number of environmental crimes were identified, including China, India, Vietnam, Belgium, Bulgaria, Lithuania, Poland, and Germany. The relationship between the number of environmental crimes for 2015 to 2019 and the environmental tax relative to GDP for the period, as well as the number of environmental crimes for 2015 to 2019 and environmental protection expenditures was determined. Measures aimed at the prevention (counteraction) of environmental crimes are systematized, which consist of three interrelated levels: national, international cooperation and cooperation with the public, public organizations. The prospect of further research is to determine the organizational aspects of criminal law counteraction to cross-border environmental crime.

Keywords: crime prevention; law enforcement; environmental protection; ecology; prevention.

JEL Classification: Q20; Q21; Q28; Q30; Q38; Q39.

Introduction

Environmental safety in the world is a priority area of national and world policy. In 2012, the WHO found that 12.6 million people died because they lived or worked in hazardous environments, accounting for nearly 1 in 4 of all deaths worldwide. Environmental risk factors such as air, water and soil pollution, chemical exposure, climate change and UV radiation caused more than 100 diseases (World Health Organization, 2016).

When Europol assessed organized crime in the European Union for 2013, 2017 and 2021, they identified environmental crime as a key threat to the security of EU citizens (Europol, 2022).

Environmental crimes are very profitable, but difficult to detect, prosecute and punish. These factors make them extremely attractive to organized crime groups. Environmental crimes very often have a cross-border aspect (Turlova 2017a).

The main mandatory document in the field of environmental protection in the EU is Directive 2008/99/EC on the protection of the environment through criminal law (European Commission, 2021a). However, the Directive has not had much effect in practice, as the Director-General for Justice and Consumers states. The number of successfully investigated environmental crimes and convicted perpetrators remains very low. Penalties for environmental crimes have often been too low, and cross-border cooperation has proved to be ineffective. According to the European Commission (2021b), all Member States have significant gaps at all levels of the law enforcement chain (police, prosecutors and criminal courts).

It is important to reduce environmental crime both in terms of the right to health and in terms of criminology and the need to reduce crime areas. The successful results of the implementation of the system for combating environmental crime are considered to be the following: a decreased number of committed environmental crimes and decreased social danger; localization of the scope of such encroachments; keeping it at a certain minimum level of criminal offences acceptable to society; elimination or reduction of the negative consequences of environmental crime for the natural environment (Turlova 2017a).

Research Objectives

The aim of this article is the systematization of the measures to prevent (counteract to) the environmental crime.

Research objectives of the article:

1. Identify the countries with the largest and smallest number of environmental crimes, criminal legislation enshrining criminalized actions that harm the environment and the punishment for their commission.
2. Determine which acts that harm the environment are criminalized and find out the penalties provided for their commission.
3. Analyse statistics on the number of environmental crimes, the amount of environmental taxes, environmental protection expenditures.
4. Establish the level of the relationship between the number of environmental crimes, the environmental tax relative to GDP, environmental protection expenditures.
5. Develop a system of measures to prevent (counteract) environmental crimes.

1. Literature Review

The criminal law influence on environmental crime includes: activities related to the creation of tools the criminal law offers to combat crime; practical application of those tools. The effectiveness of the criminal law influence on environmental crime depends on the perfection of the provisions that establish responsibility for violations of the environmental law. Therefore, criminal legislation in the field of environmental protection must meet the requirements of logic, internal coherence, balance and consistency (Turlova 2017b). The influence of the punishment on the state of environmental crime remains unexplored.

The most important ways in the field of combating environmental crime are:

- taking into account the sanction for the commission of the crime when determining the content of the act, the form of guilt, the methods of its commission and other signs of the objective party;
- practicing specific rates for the unification of case law when calculating the amount of damage instead of evaluative concepts;
- improving the calculation methodology and practice of compensation for damage caused by environmental crimes;
- minimizing the practice of constructing contracted compositions of crimes or specifying the concept of "threat" in such compositions (Golubev *et al.* 2020).

The researchers studied the narrow field of combating environmental crimes through the prism of the application of criminal legislation.

States use criminal law as a basis for combating environmental crimes. The creation of networks of bodies responsible for compliance with environmental legislation and their coordination was an important progress in the prevention of environmental crimes (Bahadar A. *et al.* 2022). Coordination of public authorities and law enforcement agencies at the international level as a measure to combat environmental crimes remains problematic.

The difficulties at all stages of law enforcement and policy-making cause the problems in countering, detecting and preventing transboundary environmental crimes. Many law enforcement officers specialize in one specific crime. This approach is ineffective in responding to the diversification of organized crime (Interpol, 2015; Van Uhm and Nijman 2020). Arkhipova *et al.* (2020) studied the international fight against the illegal wildlife trafficking, which involves the development of the necessary unified international strategy to combat this type of offences; introduction of new forms and methods of cooperation at the international level; application of integration; creation of international organizations, commissions, working groups and committees to combat the illegal wildlife trafficking. The issue of the effectiveness of measures to combat crimes against wildlife and other environmental crimes remains unsettled.

Creating a favourable environment for public participation in environmental protection in the form of non-governmental organizations can be the most effective way to prevent and counter environmental crimes (Shohani *et al.* 2021). Non-governmental organizations contribute to the criminal justice system in achieving its goals by fulfilling their crime reporting responsibilities. This helps the criminal justice system to detect crimes, which is important in protecting the natural environment (Park and Kramarz 2019). Achieving this partnership requires free access to environmental information, public participation in the decision-making process, actual decision-making, and participation in legal proceedings (Shohani *et al.* 2021).

Political, institutional, regulatory, information and professional gaps create the problem of the effectiveness of the application of environmental provisions. The lack of consistency between regulatory support, the information volume and insufficient resources reduce the effectiveness in countering and investigating environmental crimes (Sahramäki and Kankaanranta 2021).

2. Materials and Methods of Research

The main approach in the studying the effectiveness of criminal law prevention of and counteraction to environmental crimes was to identify countries with the largest and smallest number of environmental crimes. We hold that the analysis of the indicators under research in these countries best reflects the effectiveness of criminal law counteraction to environmental crimes.

The effectiveness of criminal law counteraction to environmental crimes was studied through the analysis and generalization of criminal law, in particular to determine which acts that harm the environment are criminalized and find out the penalties provided for their commission.

Statistics on the number of environmental crimes, the amount of environmental taxes, environmental protection expenditures were analysed through the statistical analysis.

The correlation analysis was used for establishing the relationship between: the number of environmental crimes in the countries under research for 2015 to 2019 and the environmental taxes relative to GDP for 2015 to 2019, the number of environmental crimes in the countries under research for 2015 to 2019 and the environmental protection expenditures for 2015-2019.

The following formula 1 of correlation analysis was used:

$$r = \frac{\sum(x_{1i} - \bar{x}_1)(x_{2i} - \bar{x}_2)}{\sqrt{\sum(x_{1i} - \bar{x}_1)^2} \sqrt{\sum(x_{2i} - \bar{x}_2)^2}}$$

where x_1 – the number of environmental crimes; x_2 – the amount of environmental tax, r – linear correlation coefficient.

The assumptions about the effectiveness of criminal law counteraction to environmental crimes are proved through the hypothetico-deductive model, the method of generalization and analogy.

The study used the most significant scientific works that reflect the development of scientific thought in the field of criminal law counteraction to crime, including environmental crime, for 2010 to 2022.

The following indicators are analysed in the paper:

- Environmental Crime statistics for 2015 - 2020 is provided by the Environmental Investigation Agency.
- Environmental tax (total, % of GDP) for 2015 - 2019 is available in the OECD data.
- Environmental protection expenditures for 2015 - 2019 are reflected in CEIC, NationMaster.

3. Research Results

The fundamental measures of criminal law counteraction to environmental crimes are:

- establishment of a list of actions that threaten the surrounding natural environment;
- enshrining them in the criminal legislation and determining the punishment for their commission;
- coordinated activity of law enforcement agencies.

China, India and Vietnam have the highest number of wildlife crimes, including wild animal with elephants, rhinos, lizards, tigers, leopards, snow leopards, cloud leopards, totoabas, and various species of wood. In European countries, the number of criminal offenses committed with the mentioned objects is insignificant. During 2015-2020, there are only 10 incidents in Belgium, and 17 in Germany (Table 1).

Table 1. Environmental Crime

Countries	2015	2016	2017	2018	2019	2020
Wildlife and incident around the world						
China	179	164	144	212	554	186
India	193	202	133	187	249	300
Vietnam	46	61	75	96	127	227
Belgium	2	0	2	1	5	0
Germany	1	4	3	4	3	2
Refrigerant Gas Seizures						
Bulgaria	-	1	1	82	7	8
Lithuania	-	-	-	-	60	14
Poland	-	-	-	7	11	-

Source: Environmental Investigation Agency (2022a), Environmental Investigation Agency (2022b).

Bulgaria, Lithuania and Poland have the largest number of crimes with the refrigerants committed during 2015-2020.

Under European law, sanctions for environmental crimes are much less punishable than in Asia, with the exception of India. In China, environmental crimes that involve wildlife destruction are punished by a maximum imprisonment of up to 10 years, a fine, confiscation; deforestation — 3 to 7 years imprisonment, a fine. In India, the wildlife destruction is punished by imprisonment for up to 2 years, a fine. In Vietnam, the wildlife and forest destruction is punished by the imprisonment for up to 15 years, a fine, as well as liability of a legal entity. In Belgium, the destruction of animals is punished by imprisonment, a fine. In Poland, the destruction of animals and destruction of forests is punished by imprisonment for up to 5 years, fine, custodial restraint (Criminal Code of Vietnam, 2022; Criminal Law of the People's Republic of China, 2022; Indian Penal Code, 2022; legislationline, 2022).

So, the legal enshrinement of environmental crimes and the appropriate penalty is determined by:

- 1) the number of environmental crimes committed, which is the reason for increasing sanctions as a criminal law prevention of environmental crimes;
- 2) the sanction of an article that provides for a more severe punishment is not an effective criminal law counteraction to environmental crimes.

The final stage in holding a person criminally liable is the application of the punishment prescribed by the sanctions of the articles of the criminal codes. However, offenders often manage to avoid detection of their criminal activities or otherwise escape punishment. An effective measure to combat environmental crimes are special measures aimed at the confiscation of objects encroaching on the natural environment, which is different from confiscation ordered as a result of a criminal procedure, being a measure to ensure proof in criminal proceedings.

It was established in the selected countries that only the criminal legislation of Vietnam prescribes sanctions for environmental crimes committed by legal entities. Environmental pollution crimes are often committed in the interests of legal entities. Therefore, enshrining subjects of environmental crimes in criminal legislation is the next step in improving criminal law measures to combat environmental crimes. Punishment of legal entities for committing environmental crimes must be fixed in the form of a fine, confiscation of property and liquidation, as well as deprivation of state funding, prohibition to engage in certain activities, prohibition to participate in purchases and auctions, establishment of the possibility of applying special confiscation in case of taking possession of objects of an environmental crime.

The identification, investigation, prosecution of persons guilty of committing environmental crimes and execution of punishment are important in the system of criminal law measures in the field of combating

environmental crimes. Law enforcement agencies and courts are the main subjects with duties that include the actions referred to above. Their effectiveness depends on the coherence of actions in the system and a unified approach at all levels of law enforcement. It is necessary to develop a mechanism for improving the cooperation of all law enforcement agencies and courts in order to achieve the most positive result of their activities. It includes the following:

- modernizing the collection of information for analytical and statistical analysis to establish the reasons for the increase or decrease in the number of environmental crimes in certain territories for a certain period;
- on the basis of the collected and analysed information, develop a methodology for coordinated actions of law enforcement agencies and courts, improve the tools for investigating environmental crimes;
- develop a training plan for law enforcement officers and judges;
- ensure the modernization of technical means of detection and investigation of environmental crimes.

The goal of coordinating the actions of law enforcement agencies and courts is reducing the environmental crime rates. The coordination of the said entities involves the coordination of the unified management and organization of the detection and investigation of environmental crimes:

- the signing of joint industry regulatory legal acts that detail the activities and mutual obligations of the employees of the said entities;
- joint meetings;
- organization of professional development of law enforcement officers and courts;
- collection of analytical material and statistics for the purpose of joint analysis;
- creation of joint investigative groups;
- conducting joint operations;
- quick response and coordinated work of all entities in a short period of time for the purpose of quick detection of the crime and high-quality investigation;
- providing access to the necessary databases.

Criminal law measures should include cooperation with the public and non-governmental public organizations. Direct communication of law enforcement agencies with the population and public organizations is necessary for the prevention, detection of environmental crimes and assistance in their investigation. It is appropriate to create a database of public environmental organizations and conduct joint coordination work with them. It is important to ensure the protection of these subjects as potential victims of crimes committed against them as a result of their cooperation with law enforcement agencies as subjects of combating environmental crimes.

Developed infrastructure, well-established logistics, technical progress, the scale of production facilities gave impetus to the development of cross-border environmental crime. The effectiveness of combating international crimes against the environment depends on coordinated international cooperation. International cooperation is possible at three levels:

- 1) conclusion of international agreements between two or more states;
- 2) conclusion of international agreements within the geographical region;
- 3) creation of international organizations and institutions that organize and coordinate measures to prevent and counter environmental crimes, as well as eliminate their consequences.

International cooperation in the field of combating environmental crimes implies:

- development of joint measures to detect environmental crimes, their disclosure, investigation, trial and execution of punishments for their commission;
- creating the necessary databases or providing access thereto;
- consistency of criminalization of acts that have signs of transnational environmental crimes;
- adaptation of criminal legislation in the field of environmental crimes of member countries of international treaties and organizations, and its application on the basis of a common understanding.

Therefore, it is worth noting that the effectiveness of criminal law prevention depends on the implementation of a single mechanism for counteraction to environmental crime, which includes but not limited to economic, social, political subsystems.

The correlation index between the number of environmental crimes in Table 1 and the environmental taxes relative to GDP in Table 2 is -0.60 in 2015, -0.79 in 2016, -0.78 in 2017, -0.78 in 2018, -0.78 in 2019.

Table 2. Environmental Tax (total, % of GDP)

Countries	2015	2016	2017	2018	2019
China	1,017	0,892	0,948	0,925	0,591
India	1,068	1,388	1,203	1,218	-
Vietnam	0,644	0,969	0,892	0,849	1,045
Belgium	2,100	2,195	2,250	2,231	2,142
Germany	1,919	1,864	1,621	1,774	1,760
Bulgaria	2,952	2,986	2,797	2,615	2,988
Lithuania	1,958	2,036	2,020	2,042	1,939
Poland	2,511	2,578	2,434	2,537	2,479

Source: OECD Data (2021).

So, a high level of negative relationship between the number of environmental crimes and the environmental tax relative to GDP of the countries under research during 2015 – 2019 was found. Therefore, the higher the percentage of environmental tax to GDP, the lower the number of environmental crimes committed.

Table 3 shows the amounts allocated to finance environmental protection. India's figures are based on the percentage of state budget expenditures: 0.05% in 2016, 0.04% in 2017, 0.06% in 2018, 0.09% in 2019 (Statista, 2021). The total state budget expenditures of India were as follows: \$236.6 billion in 2016, \$285.5 billion in 2017, \$291.4 billion in 2018, \$322.3 billion in 2019 (The Global Economy, 2021). So, the environmental protection expenditures in India amounted to \$118.3 million in 2016, \$114.2 million in 2017, \$174.8 million in 2018, \$290 million in 2019.

The correlation index between the number of environmental crimes listed in Table 1 and environmental protection expenditures provided in Table 3 is 0.9 in 2015, 0.44 in 2016, 0.56 in 2017, 0.61 in 2018, and 0.87 in 2019.

Table 3. Environmental Protection Expenditures

Countries	2015	2016	2017	2018	2019
China (RMB)	440,248	443,933	526,677	587,005	696,901
India (million \$)	-	118.3	114.2	174.8	290
Vietnam (VND)	2,456	2,193	1,925	-	-
Belgium (million EUR)	13,028.6	13,177	14,322.9	12,263	-
Germany (million EUR)	64,311	67,055	70,378	70,804	72,075
Bulgaria (million EUR)	979.8	681.9	764.2	840	-
Lithuania (million EUR)	507.7	590.2	565.5	547.6	535.9
Poland (million EUR)	7,970.1	8,665.7	8,815.8	8,925.1	9,096.5

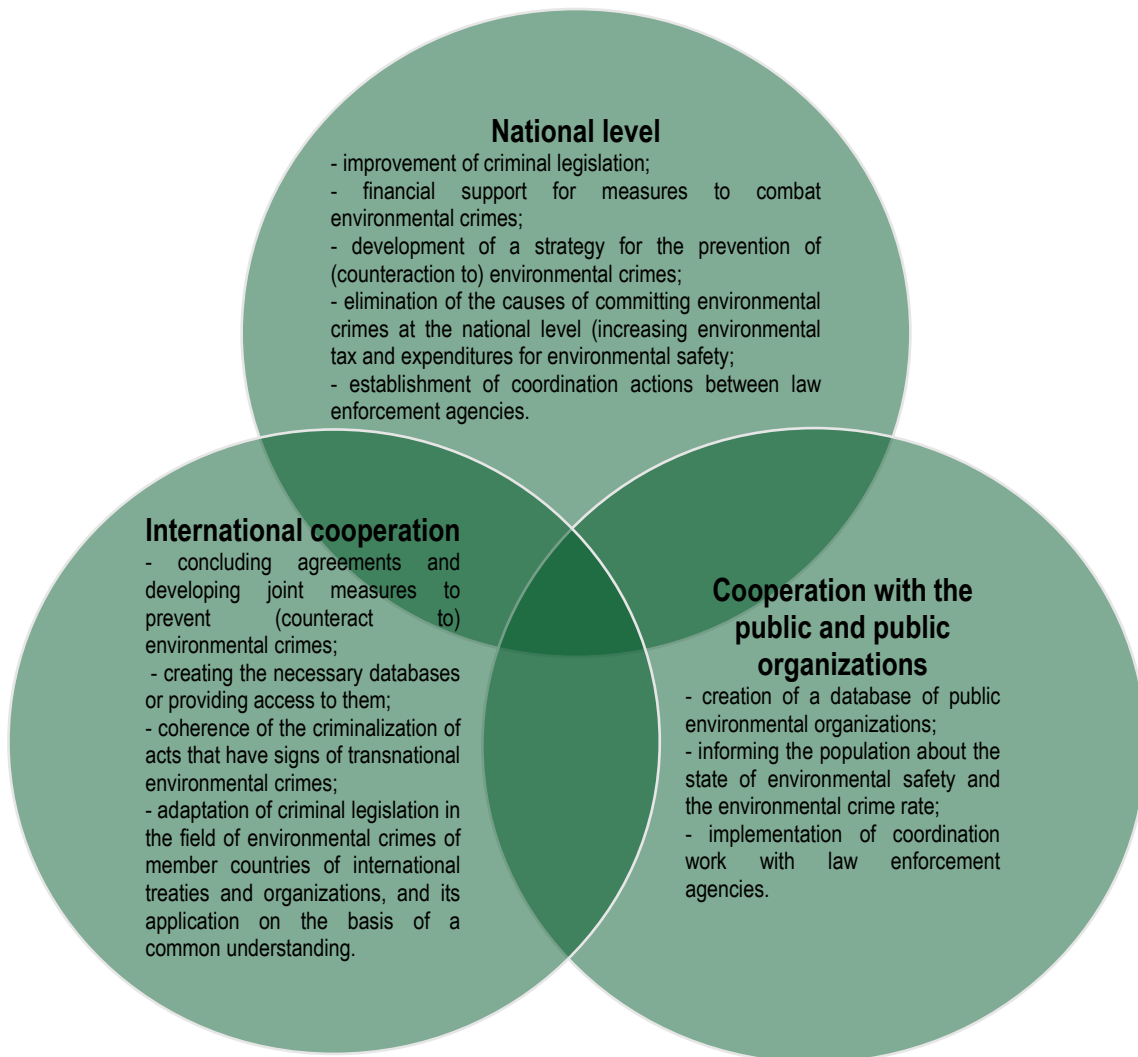
Source: CEIC (2018), CEIC (2021), NationMaster (2021).

So, there is a high and medium level of positive correlation between the number of environmental crimes and the funds allocated for environmental protection.

The effectiveness of measures to combat environmental crimes depends on their financing, organization and coherence of actions of its subjects. It is appropriate to develop and adopt national strategies that would include the main areas of eliminating problems and developing measures to combat environmental crimes with due regard to the needs of a particular country.

Systematization of measures to prevent (counteract to) environmental crimes includes three levels (Figure 1).

Figure 1. System of measures to prevent (counteract to) environmental crimes



4. Discussion

The developed system of measures to prevent (counteract to) environmental crimes includes three interdependent levels: the national level — the development and improvement of measures that cover the sphere of legal regulation, financial support and the activities of law enforcement agencies; international cooperation and cooperation with the public and public organizations.

Some researchers studied the effectiveness of some measures to combat environmental crime. One of the criminal law measures to combat environmental crime is the criminalization of acts that harm the environment and specified sanctions for their commission (Iriotis 2022). Three types of improvement of criminal environmental legislation were proposed:

- 1) revise the provisions of the Criminal Code to add environmental crimes;
- 2) develop a special criminal law on environmental protection in order to fill the gaps in the criminal legislation on the environmental protection;
- 3) adopt a subsidiary criminal law in environmental legislation and provide criminal liability for environmental crimes in the law (Fa 2018).

Besides, we propose to enshrine confiscation in the legislation as a special measure of combating environmental crimes, which is used for the purpose of seizing objects of environmental crimes, which will ensure the reduction of the financial interest of potential criminals.

Some scientists believe that a highly severe punishment is a deterrent in committing an environmental crime (Morganti *et al.* 2020; White 2016). The basis of modern criminal policy regarding environmental crimes consists of:

- minimal interference in the sustainable development of ecosystems;
- development of restorative justice;
- spread of criminal law measures applied to individuals and legal entities; the use of punishment, in particular, deprivation of liberty, as the last means of state influence; optimization of the upper limit of penalties for crimes against the environment (Virt 2021).

According to the results of the study, it was established that the number of environmental crimes does not depend on criminal legislation, and therefore it is not appropriate to argue about increasing the punishment as an effective measure of criminal law counteraction to environmental crimes.

The result of combating environmental crimes depends on the factors that contribute to their commission (Wikström and Treiber 2016) and the effectiveness of the system for combating these crimes, which is adapted to them. Combating environmental crime is the only mechanism of political, social, economic and criminal law measures. Environmental crime prevention strategies include:

- “prevention development” (the measures aimed at preventing the growth of the criminal potential of individuals);
- “prevention community” (the measures aimed at transforming social conditions that affect crime in certain (risk groups) communities);
- “situational prevention” (the strategies aimed at reducing the incidence of crime, especially by reducing opportunities and increasing risks (Brisman and South 2019).

The study proved that the number of environmental crimes depends on the amount of environmental tax and financing of environmental protection. It is proved that the higher the percentage of environmental tax in GDP, the lower the number of committed environmental crimes. The number of environmental crimes also directly depends on the amounts allocated for environmental protection.

We agree that it is impossible to counteract to environmental crime effectively without consistent planned and coordinated actions united by one concept, since systemic phenomena, including environmental crime, require a systemic approach to overcome them (Turlova 2018). The development of strategies at the international level is important in the combating environmental crime. This document includes positive practices of authorities and law enforcement agencies that combat environmental crimes and other illegal behaviour of member states. It can become the basis for the development of national strategies with due regard to the national legislation, administrative system and environmental conditions (Faure *et al.* 2018).

The transnational nature of organized environmental crime networks makes them difficult to detect unless coordinated cross-border investigations are conducted to prosecute higher-level members and lower-level traders (Virt 2019). We determine that international cooperation in the field of combating environmental crimes is an integral link in the system of measures, which is effective only in interaction with other links of criminal law measures to combat environmental crimes.

Zakalyuk (2007) arranges preventive measures against environmental crimes:

- doctrinal definition of the strategy, which includes the goal, tasks, strategic directions and results of preventive activities;
- real assessment of the state of functioning of the direct and indirect subject of activity;
- forecasting changes and trends in the subject of activity;
- determination of the procedure, forms, methods, means of prevention, general principles of its tactics, subjects of application adequate to these means;
- information support for the implementation of set tasks, in particular regarding crime, its causes, conditions, other factors, the dynamics of their change, direction and content of preventive measures and means, assessment of their effectiveness, relevant knowledge and abilities (skills) of the subjects of activity;
- making the necessary decisions in the field of management, which include: approval of preventive work plans and organizational measures for their implementation, obligations of business entities in relation to the implementation of the latter;
- horizontal and vertical coordination of preventive activities;
- implementation control;
- ensuring legal regulation;
- finance and resource provision (Zakalyuk 2007).

Turlova (2018) offers a number of directions for combating environmental crimes, which are:

- creation of a system of information and analytical support based on the results of the analysis of reliable information about its condition and determining factors, as well as monitoring data about the state of the natural environment;
- minimization of the influence of criminogenic factors and practical possibilities of committing environmental crimes;
- increasing the efficiency of law enforcement activities of criminal justice bodies regarding the detection, disclosure of environmental crimes, their investigation, trial and execution of punishments;
- implementation of informational influence on various social groups in order to form an intolerant attitude towards environmental offences;
- strengthening the role of civil society institutions in combating environmental crime (Davoodi *et al.* 2020; Turlova 2018).

We consider our systematization of the criminal law prevention of (counteraction to) more perfect in view of the results of research on the effectiveness of individual measures to combat environmental crimes, a comprehensive approach and a suggestion for the interaction of all three levels of the proposed measures.

Conclusion

So, criminal law prevention of (counteraction to) environmental crimes is part of a single mechanism that includes political, social, economic tools, which aims to reduce the number and scale of environmental crimes.

It is proved that the content of criminal law, which provides for liability for environmental crimes is determined by:

- 1) the number of committed environmental crimes, which is the reason for increasing sanctions as a criminal measure to counteract to environmental crimes;
- 2) the sanction of an article that provides for a more severe punishment is not an effective criminal measure to counteract to environmental crimes.

Therefore, the penalty defined in the sanction of the article, which provides for liability for environmental crime, does not directly affect their number, and therefore is an ineffective measure.

The results of the study can be used in the development of environmental crime prevention (counteraction) strategies.

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